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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/031,166	01/17/2002	Heinz Auer	50505	4816

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EXAMINER

PUTTLITZ, KARL J

ART UNIT PAPER NUMBER

1621

DATE MAILED: 09/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/322,318	Applicant(s) SAKAGUCHI ET AL.	
	Examiner Karl J. Puttlitz	Art Unit 1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on 10 January 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☐ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) 5-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All    b) ☐ Some \*    c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                               | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>3 and 6</u> . | 6) <input type="checkbox"/> Other:  |

## DETAILED ACTION

### *Election/Restrictions*

Applicant's election with traverse of the Restriction Requirement is acknowledged. The traversal is on the ground(s) that the grounds of restriction are not in accordance with 37 C.F.R. §§ 1.475 and 1.499, i.e., unity of invention for applications filed under 35 U.S.C. § 371. This is not found persuasive because the Restriction Requirement is in conformity with the relevant rules for national stage applications under § 371.

In this connection, M.P.E.P. § 1896 sets forth that "U.S. national stage applications (which entered the national stage from international applications after compliance with 35 U.S.C. 371) are subject to unity of invention practice in accordance with 37 C.F.R. 1.475 and 1.499 (effective May 1, 1993).

Specifically, 37 C.F.R. § 1.475(b) states that "[a]n international or a national stage application containing claims to different categories of invention will be considered to have unity of invention *if the claims are drawn only to one of the following combinations of categories:*

(1) A product and a process specially adapted for the manufacture of said product; or

(2) A product and a process of use of said product; or

(3) A product, a process specially adapted for the manufacture of the said product, and a use of the said product; or

(4) A process and an apparatus or means specifically designed for

carrying out the said process; or

(5) A product, a process specially adapted for the manufacture of the said product, and an apparatus or means specifically designed for carrying out the said process." Emphasis applied.

In the instant case, the application contains claims outside of the foregoing combinations of categories. Specifically, claim 8 drawn to a desalting apparatus, and claim 9, a desalting apparatus in combination with a distillation apparatus, are not within the combination of categories covering a process (i.e., claims 1-4) and apparatus or means for carrying out the process (i.e., claims 5-7). By the rule, this presumes lack of unity. See 37 C.F.R. § 1.475(c) "[i]f an application contains claims to more or less than one of the combinations of categories of invention set forth in paragraph (b) of this section, unity of invention might not be present."

In any event, the divergent subject matter of restricted groups represents a burden because the searched are mutually exclusive.

Based on the foregoing, the restriction is in accordance with those rules for international applications. The requirement, therefore, is still deemed proper and is made FINAL.

### **Arrangement of the Specification**

The examiner understands that the application is of foreign origin. However, Applicant is requested to conform the Specification to the requirements set forth in

M.P.E.P. § 608.01(a) and 37 C.F.R. 1.77 for arrangement of U.S. applications.

Appropriate correction is required.

### ***Claim Objections***

Claims 3, 4, and 7 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim must recite dependence from other claims in the alternative. Also, a multiple dependant claim cannot depend on another multiple dependant claim (see claim 4). See MPEP § 608.01(n).

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

The essential inquiry pertaining to this requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Definiteness of claim language must be analyzed, not in a vacuum, but in light of:

(A) The content of the particular application disclosure;

(B) The teachings of the prior art; and

(C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made. See M.P.E.P. § 2173.02.

Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

While the examiner understands that the claims are read from the standpoint of those of ordinary skill, the abbreviations TR and TA in claim 1 are confusing because it is unclear what these abbreviations are referring to. Applicant is therefore requested to insert their respective meanings at the earliest instance in claim 1.

The term "the alkali metal formate or alkaline earth metal formate" in claim 1 lacks antecedent basis in claim 1.

The term "the distillation apparatus" in claim 4 fails to have antecedent basis in claim, from which claim 4 depends.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See M.P.E.P. § 2143.

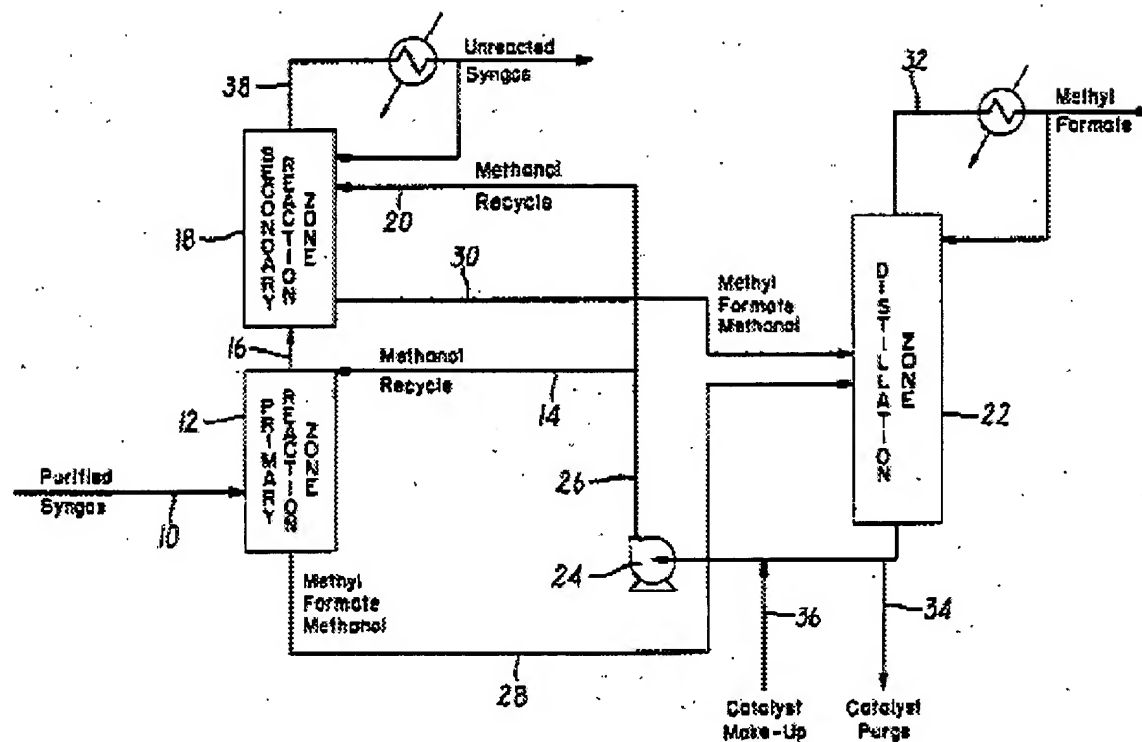
Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,661,624 to Chang et al. (Chang).

The invention covered in the rejected claims comprises, *inter alia*, a process for preparing methyl formate by reacting methanol with carbon monoxide under superatmospheric pressure and elevated temperature in the presence of methoxide salts (alkali or alkaline earth metals), with recirculating lines of liquid phase, wherein the catalyst and its degradation products are kept in solution. A TR:TA split is controlled as a function of alkali metal formate or alkaline earth metal formate content so that solid precipitates of alkali metal salts or alkaline earth metal salts are prevented. The catalyst is removed in a desalting apparatus.

Other claimed embodiments comprise 2 to 5 reactor elements, adding additional steam and/or hot water to a discharge part of TA of the liquid phase, and the desalting apparatus is in an integrated system with a distillation apparatus.

Chang teaches a process for the synthesizing of a lower alkyl formate, preferably methyl formate, in a liquid phase reaction by reacting a lower alkyl alcohol, preferably methanol, with a CO containing gas, at relatively high CO partial pressures and moderate temperatures. The reaction is catalyzed by the presence of relatively high concentrations of an effective homogeneous catalyst, preferably a homogeneous alkali metal methoxide, most preferably sodium methoxide, in the alcohol. The unreacted alcohol being separated from the alkyl formate reaction product by a suitable distillation. The unreacted alcohol, together with a fresh amount, if required, for replenishment, is recycled in two streams to the corresponding two synthesis, reaction zones, if two reaction zones are employed. See column 3, lines 10-29.

The figure schematically illustrates the number of reactor elements, and the cascade nature of the reactors:



Also Chang teaches removing catalyst and recirculating methanol, at , for example, column 4, lines 10-20: “[r]eturning to the figure, the two recycle methanol streams 14 and 20 both originate from the bottom of the distillation zone 22 and are pumped by pump 24 through line 26 back to the primary and secondary reaction zones. Also in the case of multiple reaction zones, the two effluent streams 28 and 30 emanating from the primary and secondary reactors respectively, containing the product methyl formate, unreacted methanol and homogeneous catalyst pass into the distillation zone 22 in two separate effluent streams.” The distillation and catalyst desalting are integral in element 22 ( Claim 4). See Figure above.

The difference between the process claimed in the rejected claims and the process disclosed in Chang is that Chang does not explicitly state that a TR:TA split is controlled as a function of alkali metal formate or alkaline earth metal formate content so that solid precipitates of alkali metal salts or alkaline earth metal salts are prevented.

However, Chang does teach that "the concentration of the formed product methyl formate in methanol is low this permits higher concentrations of the homogeneous catalyst to be used without fear of catalyst precipitation, thereby resulting in a higher reaction rate and, consequently, a smaller reactor cost. Such an increase in catalyst concentration is possible because the preferred catalysts such as sodium methoxide have a substantial solubility in methanol, but a very low solubility in methyl formate. Thus a lower concentration of methyl formate product in the methanol stream permits the use of higher concentrations of catalyst without the danger of *harmful precipitation and the harmful results accompanying this phenomenon*." See column 5, lines 35-48.

One of ordinary skill would expect that a stream of methyl formate would contain alkali metal formate or alkaline earth metal formate salts. Therefore, one of ordinary skill would be motivated to modify Chang to include a step of controlling catalyst solubility by controlling alkali metal formate or alkaline earth metal formate salts, since Chang teaches that controlling concentrations of methyl ester product prevents harmful precipitation, and a stream of methyl formate would contain alkali metal formate or alkaline earth metal formate salts.

Accordingly, controlling the metal salt of formate instead of the methyl ester in order to prevent precipitation of the catalyst is *prima facie* obvious in view of Chang

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since there is a reasonable expectation of success. See M.P.E.P. § 2143, discussing the requirements of a prima facie case, including a reasonable expectation of success.


**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karl J. Puttlitz whose telephone number is (703) 306-5821. The examiner can normally be reached on Monday-Friday (alternate).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann Richter can be reached on (703) 308-4532. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1235.

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